

## 2020 - 2021 Major Map

### Data Science, BS

School/College: The College of Liberal Arts and Sciences  
LADATSCIBS

Term 1 0 - 15 Credit Hours Critical course signified by ⚠	Hours	Minimum Grade	Notes
⚠ CSE 110: Principles of Programming (CS)	3	C	<ul style="list-style-type: none"> <li>An SAT, ACT, Accuplacer, IELTS or TOEFL score determines placement into first-year composition courses.</li> <li>Mathematics Placement Assessment score determines placement in mathematics course.</li> <li>ASU 101 or college-specific equivalent First-Year Seminar is required for all first-year students.</li> <li>Students who complete MAT 270 must also complete MAT 271 in Term 2. Students who complete MAT 265 must also complete MAT 266 in Term 2.</li> <li>It is highly recommended that students work with both an academic advisor from the School of Mathematical and Statistical Sciences and an assigned advisor affiliated with their chosen track.</li> <li>Select your <b>career interest area</b> and play <b>me3@ASU</b>.</li> </ul>
⚠ LIA 101: Student Success in The College of Liberal Arts and Sciences	1		
⚠ MAT 270: Calculus with Analytic Geometry I (MA) OR MAT 265: Calculus for Engineers I (MA)	4-3	C	
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
Natural Science - Quantitative (SQ)	4		
Term hours subtotal:	15-14		
Term 2 15 - 31 Credit Hours Critical course signified by ⚠	Hours	Minimum Grade	Notes
⚠ CSE 205: Object-Oriented Programming and Data Structures (CS)	3	C	<ul style="list-style-type: none"> <li>Students who complete MAT 270 must also complete MAT 271. Students who complete MAT 265 must also complete MAT 266.</li> <li>Some upper-division track courses require prerequisites. It is recommended that students consult with their advisors and use electives to complete appropriate course prerequisites.</li> <li>Create a first draft <b>resume</b>.</li> </ul>
⚠ MAT 271: Calculus with Analytic Geometry II (MA) OR MAT 266: Calculus for Engineers II (MA)	4-3	C	
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)	3		
Elective	3-4		
⚠ Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
Term hours subtotal:	16		
Term 3 31 - 46 Credit Hours Critical course signified by ⚠	Hours	Minimum Grade	Notes
⚠ DAT 250: Data Science and Society	3	C	<ul style="list-style-type: none"> <li>Students must choose and complete a minimum of 21 credit hours in their selected track. Track options are Behavioral Sciences, Biosciences, Computer Science, Mathematics, Social Sciences or Spatial Sciences.</li> </ul>
⚠ MAT 343: Applied Linear Algebra	3	C	
Natural Science - Quantitative (SQ) OR Natural Science - General (SG)	4		
Complete 2 courses:			

Elective	5
❗ Complete First-Year Composition requirement.	
Complete Mathematics (MA) requirement.	
Term hours subtotal:	15

- Some track courses may require additional prerequisites, so students will work with an assigned academic advisor in their track as well as the School of Mathematical and Statistical Sciences to select electives to satisfy necessary prerequisites.

Term 4 46 - 61 Credit Hours Critical course signified by ❗	Hours	Minimum Grade	Notes
❗ DAT 300: Mathematical Tools for Data Science	3	C	<ul style="list-style-type: none"> <li>• Students pursuing the Computer Science track are advised to take CSE 220 this term due to pre-requisite requirements in future terms.</li> <li>• Explore an <b>internship</b>.</li> </ul>
Required Track Courses	3-4	C	
Science and Society Elective	3	C	
Complete 2 courses:	6		
Elective			
Term hours subtotal:	15-16		

Term 5 61 - 76 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ DAT 301: Exploring Data in R and Python	4	C	<ul style="list-style-type: none"> <li>• Students pursuing the Computer Science track are advised to take CSE 310 in this term due to pre-requisite requirements in future terms.</li> <li>• Develop your <b>professional online presence</b>.</li> </ul>
Upper Division Required Track Courses	3-4	C	
Required Track Courses	3	C	
Humanities, Arts and Design (HU) AND Historical Awareness (H)	3		
Elective	2-3		
Term hours subtotal:	15-17		

Term 6 76 - 91 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ DAT 401: Statistical Modeling and Inference for Data Science	3	C	
Complete 2 courses:	6	C	
Upper Division Required Track Courses			
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		
Upper Division Elective	3		
★ Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).			
Term hours subtotal:	15		

Term 7 91 - 106 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ DAT 402: Statistical Learning OR CSE 475: Foundations of Machine Learning	3	C	<ul style="list-style-type: none"> <li>• Students pursuing the Computer Science track are advised to enroll in CSE 475 rather than DAT 402. Students pursuing all other tracks are advised to enroll in DAT 402 in this term.</li> <li>• Gather <b>professional references</b>.</li> </ul>
Upper Division Required Track Courses	3	C	
Upper Division Science and Society Elective	3	C	
Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)	3		
Literacy and Critical Inquiry (L)	3		
Term hours subtotal:	15		

Term 8 106 - 120 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ DAT 490: Data Science Capstone OR Disciplinary Capstone from selected track	3-2	C	<ul style="list-style-type: none"> <li>• Students pursuing the Spatial Sciences track will complete a two credit hour capstone course, all other tracks require three credits of capstone coursework.</li> </ul>
Upper Division Literacy and Critical Inquiry (L)	3		
Social-Behavioral Sciences (SB)	3		
Complete 2 courses:	5		
Upper Division Elective			

- All students pursuing a BS or BSP degree in The College of Liberal Arts and Sciences must complete two courses from the Science and Society list found at <https://thecollege.asu.edu/resources/science-society>. At least one of the two courses must be upper-division and students must earn a C or better in the courses. Both Science and Society courses (i.e., all six credits) may count towards any major, minor, related fields, and ASU General Studies requirements.
- **Behavioral Sciences Track:** In cooperation with an assigned academic advisor, students must complete five required courses from the initial group of courses displayed in the track and one additional required course from the remaining list. Students must also complete three credit hours in DAT 490 or a 400-level disciplinary capstone course drawn from the CDE, FAS, or PSY prefixes.
- **Biosciences Track:** Students are required to complete either BIO 439 or BIO/MBB 440 and three credit hours in the DAT 490 Data Science Capstone. An additional five courses (minimum of 15 credit hours) are chosen from the remaining track electives.
- **Computer Science Track:** In consultation with advisor, students must complete four required courses (12 credit hours) and pick two related courses (6 credit hours). In addition, they must complete three credit hours in the DAT 490 Data Science Capstone.
- **Mathematics Track:** Students are to complete MAT 267 and MAT 275. In cooperation with an academic advisor, students must also select four courses from the remaining courses in the track list below. In addition, students need to complete three credit hours in DAT 490 Data Science Capstone.
- **Social Sciences Track:** In consultation with an assigned academic advisor, students will select six courses for a minimum of 18 credit hours from the track list below, at least 12 credit hours of which must be upper-division. In addition, students must complete 3 credit hours in DAT 490 Data Science Capstone or a disciplinary-specific capstone course.
- **Spatial Sciences Track:** Students must complete all six courses listed in the track. In addition, they will complete two credit hours of DAT 490 Data Science Capstone or a 400-level GIS capstone course chosen in consultation with an assigned academic advisor.

## Hide Course List(s)/Track Group(s)

Behavioral Sciences Track	Biosciences Track	Computer Science Track
<b>Complete five courses from list below:</b>	<b>Complete one course from list below:</b>	<b>Complete four courses from list below:</b>
CDE 232: Human Development (SB) or FAS 101: Personal Growth in Human Relationships (SB) or PSY 101: Introduction to Psychology (SB)	BIO 439: Computing for Research	CSE 220: Programming for Computer Engineering or CSE 240: Introduction to Programming Languages
FAS 498: Advanced Statistics for Social Sciences or PSY 330: Statistical Methods (CS)	BIO 440: Functional Genomics or MBB 440: Functional Genomics	CSE 310: Data Structures and Algorithms
PSY 290: Research Methods (L or SG)	<b>Choose five elective courses from list below:</b>	CSE 365: Information Assurance
PSY 498: Data Mining in the Behavioral Sciences or STP 450: Nonparametric Statistics or STP 452: Multivariate Statistics	BIO 355: Introduction to Computational Molecular Biology (CS)	MAT 243: Discrete Mathematical Structures
SOC 390: Social Statistics I (CS)	BIO 411: Quantitative Methods in Conservation and Ecology	<b>Choose two elective courses from list below:</b>
<b>Choose one elective course from list below:</b>	BIO 415: Biometry (CS)	CSE 450: Design and Analysis of Algorithms
CDE 312: Adolescence (SB) or SOC 312: Adolescence (SB)	BIO 439: Computing for Research	CSE 467: Data and Information Security
CDE 337: Early Childhood Intervention	BIO 440: Functional Genomics or MBB 440: Functional Genomics	CSE 471: Introduction to Artificial Intelligence
	BIO 494: Data Analysis in Neuroscience	CSE 476: Introduction to Natural Language Processing

CDE 418: Aging and the Life Course (SB & H) or SOC 418: Aging and the Life Course (SB & H)		
CDE 430: Infant/Toddler Development in the Family (SB)		
CDE 450: Child Dysfunction in the Family		
FAS 301: Introduction to Parenting		
FAS 332: Human Sexuality (SB)		
FAS 435: Advanced Marriage and Family Relationships (L or SB) or SOC 435: Advanced Marriage and Family Relationships (L or SB)		
FAS 440: Fundamentals of Marriage and Family Therapy		
LSC 325: Physiological Psychology or PSY 325: Physiological Psychology or PTX 325: Physiological Psychology		
PSY 315: Personality Theory and Research (SB)		
PSY 320: Learning and Motivation		
PSY 324: Memory and Cognition		
PSY 341: Developmental Psychology (SB)		
PSY 350: Social Psychology (SB)		
Mathematics Track	Social Sciences Track	Spatial Sciences Track
<b>Complete both courses below:</b>	<b>Complete six courses from list below:</b>	<b>Complete all six courses below:</b>
MAT 267: Calculus for Engineers III (MA)	ACO 100: All About Data: Design, Query, and Visualization (CS)	GIS 205: Geographic Information Science I (CS)
MAT 275: Modern Differential Equations (MA)	ALA 235: Introduction to Computer Modeling (CS)	GIS 211: Geographic Information Science II (CS)
<b>Choose four elective courses from list below:</b>	AML 253: Introduction to Mathematical Tools and Modeling for the Life and Social Sciences	GIS 311: Geographic Information Science III (CS)
ACT 370: R and Excel for Actuaries	AML 441: Mathematical Concepts and Tools in Sustainability	GIS 322: Programming Principles in GIS II
ACT 435: Statistics for Risk Modeling	ASM 494: Models in Social Evolution	GIS 461: Fundamentals of Spatial Optimization
MAT 300: Mathematical Structures (L)	BME 301: Numerical Methods in Biomedical Engineering	GIS 471: Spatial Statistics for Geography and Planning
MAT 353: Mathematics and Cancer	BMI 211: Modeling Biomedical Decisions	
MAT 419: Introduction to Linear Optimization (CS)	BMI 461: Advanced Topics in Biomedical Informatics I	
MAT 420: Scientific Computing	BMI 462: Advanced Topics In Biomedical Informatics II	
MAT 421: Applied Computational Methods (CS)	COM 308: Advanced Research Methods in Communication (L)	
MAT 423: Numerical Analysis I (CS)	COM 407: Advanced Critical Methods in Communication	
MAT 425: Numerical Analysis II (CS)		
MAT 429: Optimization		
MAT 451: Mathematical Modeling (CS)		

MAT 452: Introduction to Chaos and Nonlinear Dynamics	CRJ 303: Statistical Analysis (CS)
STP 310: Design and Analysis of Experiments	ECN 410: Applied Regression Analysis and Forecasting
STP 311: Regression and Time Series Analyses	ECN 416: Game Theory and Economic Behavior
STP 420: Introductory Applied Statistics (CS)	EDP 454: Statistical Data Analysis in Education (CS)
STP 429: Applied Regression (CS)	FAS 361: Research Methods (L or SB)
	FAS 498: Advanced Statistics for Social Sciences
	GCU 351: Population Geography (SB & G)
	GCU 496: Geographic Research Methods (L)
	GPH 494: Advanced Digital Analysis
	HSE 290: Experimental Methods for Human Systems Research (L)
	HSE 390: Qualitative Research Methods (L)
	IFT 200: Information Modeling, Storage and Retrieval
	MKT 352: Marketing Research (L)
	POS 401: Political Statistics (CS)
	PSY 330: Statistical Methods (CS)
	SBS 302: Qualitative Methods
	SBS 389: Ethnographic Field Lab
	SBS 404: Social Statistics II: Multivariate Analysis (CS)
	SOS 211: Calculus and Probability for the Life and Social Sciences (MA)
	SOS 424: Dynamic Modeling in Social and Ecological Systems
	SOS 441: Mathematical Concepts and Tools in Sustainability or AML 441: Mathematical Concepts and Tools in Sustainability
	STP 310: Design and Analysis of Experiments
	STP 311: Regression and Time Series Analyses
	STP 452: Multivariate Statistics
	TWC 301: Fundamentals of Writing for Digital Media (L)
	TWC 411: Principles of Visual Communication (L)

**Notes:**

Please keep in mind that the applicability of a specific transfer course toward an ASU degree program depends on the requirements of the department, division, college or school in which you are enrolled at ASU. Transfer agreements that guarantee the completion of university level requirements do not necessarily meet college and major requirements. Please consult with an advisor for more information.

**Total Hours:** 120

**Upper Division Hours:** 45 minimum

**Major GPA:** 2.00 minimum

**Cumulative GPA:** 2.00 minimum

**Total hrs at ASU:** 30 minimum

**Hrs Resident Credit for**

**Academic Recognition:** 56 minimum

**Total Community College Hrs:** 64 maximum

**Total College Residency Hrs:** 12 minimum

### **General University Requirements Legend**

General Studies Core Requirements:

- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

General Studies Awareness Requirements:

- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

First-Year Composition

General Studies designations listed next to courses on the major map were valid for the 2020 - 2021 academic year. Please refer to the course catalog for current General Studies designations at time of class registration. General Studies credit is applied according to the designation the course carries at the time the class is taken.